

#### REMARKS

Claim 15 stands rejected under 35 USC 112, second paragraph. Claim 15 has been amended and applicant believes that the rejection has been removed.

Claim 8 stands rejected under 35 USC 103 over Tigges et al in view of Oshima. Applicant notes for the record that both Tigges et al and Heer et al (previously relied on) are derived from PCT/DE00/00537. Thus, both Tigges et al and Heer et al are directed to application of the same underlying technology, namely a rudder propeller of lower vertical height than had previously been attained.

As previously explained, the present invention, as defined in claim 8, is concerned with a water craft comprising a cargo deck at least in the aft region of the water craft and above which the hull of the craft defines a cargo space for accommodating trucks and other wheeled vehicles. Thus, the invention is particularly applicable to RoRo and RoPax vessels, in which vehicles are driven on and off the vessel through doors in the stern of the vessel. This mode of operation implies a need for the cargo space at the aft end of the water craft to be clear of unnecessary obstructions. In accordance with the present invention, as defined in claim 8, the water craft comprises a main propulsion means located in the aft region of the water craft, and at least first and second steering propulsion devices installed below the cargo deck and located in the aft region of the water craft to first and second opposite sides respectively of the main propulsion means. The output required by the steering propulsion devices is less than 50% of the shaft output of the main propulsion means and the steering propulsion devices. Thus, the output of the steering propulsion devices is less than one third of the output of the main propulsion means.

The method claim 16 is similar to claim 8 in several respects but does not recite first and second steering propulsion devices. Instead, claim 16 recites the steps of applying

steering propulsion forces to the water craft at first and second locations in the aft region to the first and second sides respectively of the main propulsion means and selectively varying the directions of the steering propulsion forces applied to the water craft at the first and second locations. These steps effect steering of the water craft. Also, instead of specifying the relative power requirements of the steering propulsion devices and the main propulsion means, claim 16 recites an operating step that relates to the practical reason for the limitation in claim 8 regarding power requirements, namely that the main propulsion means is used for propulsion of the water craft, not for steering,

Tigges et al discloses a ship comprising two rudder propellers and a hull that defines a cargo space for accommodating wheeled vehicles. This is no different from the disclosure of Heer et al, which discloses a RoRo or RoPax ship (column 4, line 8) having two rudder propellers (FIG. 2).

Oshima discloses that a ship that uses underwater acoustic equipment, such as an oceanic research ship, may with advantage employ turning propellers 3 for steering and a separate main propeller 1 for propulsion because such an arrangement generates underwater noise at a reduced level. Oshima contains no disclosure regarding a cargo deck or a cargo space and there is nothing in Oshima that would lead a person of ordinary skill in the art to apply the teaching of Oshima to a water craft having a cargo space in an aft part of the hull.

The issue in this case is whether the examiner was correct in rejecting claims 8 and 16 under 35 USC 103 over Tigges et al in view of Oshima. Resolution of this issue turns on whether it would have been obvious to a person of ordinary skill in the art to employ a propulsion/steering mechanism similar to that shown by Oshima in the ship disclosed by Tigges et al. This question has already been discussed fully in connection with the rejection based on Oshima and Heer et al.

In support of the rejection the examiner argues that it would have been obvious to one having ordinary skill in the art to utilize, in the ship shown by Tigges et al, a main propulsion means located in the aft region of the water craft for propelling the water craft in a forward direction and first and second steering propulsion devices located in the aft region of the water craft to the first and second sides of the main propulsion means generally as taught by Oshima. Applicant submits that the examiner attributes too much to the disclosure of Oshima. Oshima does not contain a general teaching that a water craft should be provided with a main propulsion means located in the aft region of the water craft for propelling the water craft in a forward direction and first and second steering propulsion devices located in the aft region of the water craft to the first and second sides of the main propulsion means. On the contrary, Oshima is concerned with a very specific problem, namely excessive underwater noise in a vessel having a need for a quiet underwater environment, and the teaching of Oshima is directed to this problem. A person having ordinary skill in the art, wondering whether the disclosure of Oshima would be relevant to improving the ship of Tigges et al, must surely consider the problem that is solved by Oshima since that is the only indicator of the improvement that might be achieved by applying the disclosure of Oshima to the ship of Tigges et al. Should the problem that is solved by Oshima not exist in the ship of Tigges et al, there would be no clear reason why the person having ordinary skill in the art would apply the disclosure of Oshima to the ship of Tigges et al. Applicant submits that it would not have been obvious to a person having ordinary skill in the art to apply teaching that relates to the problem of reducing underwater noise to the ship of Tigges et al in which there is no requirement for a quiet underwater environment.

The examiner's position appears to be that because it would be technically feasible to apply the disclosure of Oshima regarding a main propulsion means and steering propulsion devices

to a water craft that has no need for a quiet underwater environment, it would have been obvious to do so. A rejection under 35 USC 103 requires more than a showing of technical feasibility. MPEP 2143 explains that to establish a *prima facie* case of obviousness based on multiple prior art references, the first of the three basic criteria that must be met is that "there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art,...to combine the reference teachings." The arguments presented by the examiner are silent with respect to motivation or suggestion to combine the teachings of Tigges et al and Oshima.

Claim 16 requires that the main propulsion means be used exclusively to propel the water craft, i.e. that the main propulsion means is not used for steering. Oshima does not disclose or suggest that the main propulsion means of a water craft should not be used for steering the water craft. On the contrary, Oshima appears to be indifferent with respect to whether the main propulsion means is used for steering. FIGS. 4-6 show a craft in which the propeller 1 that is used to propel the craft is also used for steering, by means of a rudder 4, and FIGS. 7-8 show a craft in which the propeller 3 that is used to propel the craft is a steering propeller. Thus, regardless of whether the propeller 1 of the craft shown in FIGS. 1-3 is used for steering, the disclosure in Oshima, taken as a whole, would not suggest to a person of ordinary skill in the art that the main propulsion means of a water craft should be used exclusively to propel the craft.

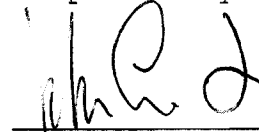
As noted above, so far as the examiner's rejection is concerned the disclosure of Tigges et al is substantially similar to that of Heer et al. Both Tigges et al and Heer et al claim benefit of PCT/DE99/01422, DE 199 28 961.1, PCT/DE99/01842 and PCT/DE00/00537. Thus, both Tigges et al and Heer et al are directed to application of the same underlying technology, namely a rudder propeller of lower vertical height than had previously

been attained. Although the main focus of the Tigges et al is on the underwater configuration of the hull and the main focus of Heer et al is on the structure of the rudder propeller, Tigges et al and Heer et al each refer to the rudder propeller being advantageous with respect to utilization of the cargo deck(s): see Heer et al, column 2, lines 28-38 and Tigges et al, page 6, lines 13-23. These features of Tigges et al and Heer et al are not relevant to the disclosure of Oshima. Therefore, a person having ordinary skill in the art would see no connection between Tigges et al (or Heer et al) and Oshima such as would suggest that a feature of Oshima should be applied to the ship of Tigges et al (or Heer et al).

In view of the foregoing, applicant submits that the disclosure of Oshima regarding a main propeller and two turn type propellers is not properly combinable, in the manner suggested by the examiner, with that of Tigges et al regarding a ship that is driven by two rudder propellers and has a cargo space for accommodating trucks and other wheeled vehicles. Accordingly, the invention as defined in claims 8 and 16 is not disclosed or suggested by Tigges et al and Oshima, whether taken singly or in combination. Therefore claims 8 and 16 are patentable and it follows that the dependent claims also are patentable.

A second declaration of Karl Hamberg is submitted herewith. Mr. Hamberg's second declaration supports the arguments presented above in support of patentability of claims 8 and 16.

Respectfully submitted,



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Docket: AWEK 2881

STATEMENT OF KARL HAMBERG

I have read the foregoing REPLY TO THE OFFICE ACTION MAILED 11/13/2006 and in my opinion as an expert regarding design and construction of water craft, the facts stated on pages 5-9 above are true.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Title 18, United States Code, Sec. 1001, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Karl H.  
Name

24. 1. 2007  
Date

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of

Jari SIRVIÖ et al

Art Unit: 3617

Application No: 10/500,056

Examiner:  
Jesus D. Sotelo

Filed: June 23, 2004

For: ARRANGEMENT FOR STEERING A WATER-  
CRAFT

DECLARATION OF KARL HAMBERG

COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Sir:

I, Karl Hamberg, declare as follows:

1. I was awarded the degree of Master of Science in Naval Architecture by Helsinki University of Technology in 1972.

2. Currently I am employed by Aker Arctic Technology Inc., which is a subsidiary company to Aker Finnyards Oy. Between 1973 and 2005 I was employed by Aker Finnyards Oy or its predecessors in Helsinki. For a period of 16 years, I acted as Head of the Project Design department, responsible for the Naval Architectural aspects of numerous projects and newbuildings. These include passenger cruise vessels, RoRo passenger ferries, naval vessels, icebreakers, cable layers, supply vessels, oceanographic research vessels, and container vessels.

3. By virtue of my education and experience, I am familiar with the level of skill of those engaged in the design and construction of water craft, and in particular with the design and construction of propulsion means and steering means for water craft, and I am an expert regarding the matters of opinion addressed in this declaration.

4. I am familiar with the contents of U.S. Patent Application No. 10/500,056 filed June 23, 2004 ("the '056

application"). I am also familiar with the disclosure of U.S. Patent 6,709,109 (Heer et al), Canadian Published Patent Application No. 2,373,462 (Tigges et al) and the English language abstract of Japanese Laid-Open Publication No. JP-914239A (Oshima), as cited by the examiner in prosecution of the '056 application.

5. The '056 application is assigned of record to Kvaerner Masa-Yards Oy, a predecessor of Aker Finnyards Oy, which in turn is the parent company of my current employer. I have no interest in the outcome of the '056 application that is different from the interest of other employees of Aker Finnyards Oy or its subsidiaries.

6. Typically, RoRo vessels have frequent port calls and therefore good maneuverability is important. Steering propulsion devices are attractive for use with RoRo vessels, because they provide both good maneuverability and efficient propulsion. Accordingly, in a conventional RoRo vessel employing steering propulsion devices, the steering propulsion devices are sized to provide the propulsion power for the vessel.

7. It is known to provide a RoRo vessel with a wide stern ramp for transfer of cargo between the cargo space and port facilities. The available height for the installation of propulsion devices below the cargo space is dictated by port facilities, hydrodynamic requirements and ship stability. It is obvious that the size of a steering propulsion device is, inter alia, dependent on its power rating. In a conventional RoRo vessel employing steering propulsion devices that are sized to provide the propulsion power for the vessel, the upper parts of the steering propulsion devices extend up through the cargo deck, limiting the cargo space and preventing unobstructed movement of the cargo during loading and unloading.

8. An aim of the invention described in the '056 application is to provide more space and better utilization of the cargo space in RoRo vessels. The invention is based at



least in part on the recognition that the power of the steering propulsion devices necessary to achieve good maneuverability is typically well below the required power for propulsion.

9. The solution described and claimed in the '056 application is based on utilizing a main propulsion device to provide most of the power needed for propulsion of the vessel and at both sides thereof two smaller steering propulsion devices for steering and to provide the balance of the power needed for propulsion. The combined power output of the steering propulsion devices should be less than 50% of the total output of the propulsion arrangement. Hereby the ship can be provided with efficient propulsion means as well as good maneuverability due to the steering propulsion devices, which can remain relatively small and relatively lightweight and, thus, require less space than the steering propulsion devices of Tigges et al and Heer et al. It is to be expected that this arrangement would be less expensive compared to a traditional one with two large steering propulsion devices, and still, it allows for more cargo and more efficient movement thereof during harbor operations.

10. The reference Oshima, JP 9142391 A, discloses a vessel which is intended for oceanic research and is provided with a propulsion configuration selected to achieve a reduction of underwater noise, which is known to be harmful for underwater acoustic equipment. Although this configuration resembles the one utilized in accordance with the invention as such, Oshima is entirely silent as regards any problems related to better utilization of cargo space at the aft part specifically regarding RoRo vessels. On the basis of the figures the ship does not have any cargo space at the aft part at least suitable for RoRo cargo. Oshima is silent also regarding the division of output power between the main propulsion means and the steering propulsion devices.

11. The reference Heer et al, US 6,790,109 B1, discloses an electric steering propeller arrangement. The aim of Heer et

al is to provide more space in the stern of the ship, specifically of the RoRo type, when electrical steering propellers are utilized. The solution is to use special arrangements at the upper part of the steering propellers enabling flatter mounting thereof, and thus, gain more space on the cargo deck. Thus, the goal of the arrangement shown by Heer et al is much the same as is the case with the present invention. The total propulsive power is in the case of Heer et al distributed to the steering propellers. So, in principle, the common aim of Heer et al and the present invention is to provide for more space for cargo in RoRo vessels and better utilization of the space available during harbor operations. In practice, however, the aims have been achieved in quite different ways resulting in alternative solutions respectively. Heer et al has chosen to modify the upper construction of the propulsion arrangement based on steering propellers only, whereas according to the invention quite another kind of propulsion arrangement has been selected based on distributing the power output between different types of propulsion means, which permits use of lower power, and hence smaller, steering propulsion devices. As a consequence, compared with Heer et al, the arrangement according to the invention has a potential for better redundancy, lower weight and costs, since the large steering propellers of Heer et al require heavy, large and expensive electric generator sets to provide the needed electric power for the steering propellers.

12. The reference Tigges et al, CA 2,373,462 A1, discloses an electric steering propeller arrangement that is, in my opinion, substantially similar to that of Heer et al. regarding features relevant to the '056 application. Thus, the details of FIG. 3 of Tigges et al regarding the steering propellers are substantially similar to those shown in FIG. 1 of Heer et al. FIG. 3 of Tigges et al shows that the steering propellers are of relatively low vertical height. However, the main focus of Tigges et al is on the hydrodynamic shape of the hull form forward of and around the thrusters. Therefore, one

may suspect that the geometry shown by Tiggers et al in this respect is "indicative only". This is contrary to Heer et al, which focuses on the geometrical aspects of the fitting of thrusters to the hull. As a conclusion, In my opinion so far as the invention disclosed and claimed in the '056 application is concerned, Tiggess et al adds nothing of substance to Heer et al.

13. As regards combining the teachings of Heer et al or Tiggess et al and Oshima, due to excellent maneuverability inherently provided by the steering propellers, there is no need to totally change the propulsion configuration of Heer et al or Tiggess et al, which has specifically and already been adapted for the space requirements as disclosed. The hydro-acoustic noise problem referred by Oshima has no relevance in the ship types discussed by Heer et al and Tiggess et al.

14. Therefore in my opinion a person of ordinary skill in the art, presented with the disclosures of Heer et al, Tiggess et al and Oshima, would not have found it obvious to combine these disclosures in the manner suggested by the examiner and arrive at the invention as claimed in the '056 application. In particular, in my opinion a person of ordinary skill in the art would not have found it obvious to apply the teaching of Oshima regarding a main propulsion arrangement and two steering propellers at opposite respective sides of the main propulsion arrangement to the vessel shown by either Tiggess et al or Heer et al. In my opinion, the only possible reason why a person of ordinary skill in the art would apply the propulsion and steering arrangements disclosed by Oshima to the ship of Tiggess et al or Heer et al would be to reconstruct the invention claimed in the '056 application with benefit of hindsight.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that

willful false statements and the like so made are punishable by fine or imprisonment, or both, under Title 18, United States Code, Sec. 1001, and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

RL 76

Name

24, 1, 2007

Date